REMARKS

The examiner noted that Applicant's arguments filed 3/30/07 were persuasive and thus withdrew the rejections. Upon further consideration, the examiner made new grounds of rejection which Applicant addresses below:

35 U.S.C. §112

The examiner rejected Claim 11 since there was insufficient antecedent basis for "methanol" at line 7. The examiner also rejected Claims 14 and 23-26 since there was insufficient antecedent basis for "the container" in lines 1 and 2.

Applicant has amended claims 11, 14 and 23-26 to overcome the rejection. Applicant has also amended claim 12 to include features previously recited in claim 11. No new matter has been added.

35 U.S.C. § 102

The examiner rejected Claims 11-15 and 24 under 35 U.S.C. 102(a) as being anticipated by Deinzer et al (WO 03/043112) using (US 2006/0172171) as an equivalent English translation.

According to the examiner:

> **The Deinzer reference discloses a fuel cartridge " 1 " comprising a housing containing and in direct contact with methanol and having at least a portion of a wall "lb" that is disposed adjacent the fuel egress port "la" of the cartridge that is comprised of metal; a fuel egress port "la" supported by the housing; and remaining walls "312" of the cartridge that are made of elastomer which is thermally insulating (See paragraphs [0064],[0067],[0072] and Figure 3).**
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> **Examiner's note: The inner sleeve "312" is construed as being part of the wall of the housing. The limitation "sinking heat generated from external components to enhance a delivery rate of methanol in a vapor phase to the egress port of the container" is construed as intended use. Therefore, this limitation is not given patentable weight. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.**

Claim 11 is neither described nor suggested by Deinzer. Claim 11 calls for a fuel cartridge ... comprising a housing, the housing containing and in direct contact with a liquid

source of an oxidizable fuel and having at least a portion of a wall of the housing being comprised of a thermally conductive material and a fuel egress port supported by the housing ....

In contrast, Deinzer discloses:

> **[0067] The cartridge 1 exhibits a dimensionally stable outer housing 1b which exhibits a closure device 311 at one end, the said closure device closing an outlet 1a. Within the housing 1b, an inner sleeve 312 is provided which runs parallel to the longitudinal axis of the housing 1b and is joined sealed against fluids (i.e. sealed against gas and/or liquid) with the inner surface of the end at the outlet end and the inner surface of the end of the housing opposite to the outlet end. In this case the inner sleeve 312 is formed as a bellows (for example from an elastomer).**
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> ****
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> **[0070] The type of materials used for the cartridge 1 depends substantially on the chemical properties of the fuel, but also on the fields of application of the fuel cell. An outer housing 1b of metal is mechanically and thermally more stable than a plastic housing. Due to the higher material strength, higher internal pressures can be used. With the same external dimensions a larger internal volume can be obtained. In comparison, plastics have a weight advantage and are more dimensionally stable with regard to moderate external forces.**
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> **[0071] In particular with methanol as the fuel, it should be noted that most plastics in contrast to metals exhibit a permeability for methanol which cannot be neglected and is sometimes quite high.**
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> **[0072] When using methanol as the fuel, the outer housings 1b of the described fuel cartridges 1 are therefore produced with preference for the use of metallic materials. Housings completely made of metal as well as the use of composite materials containing metal and/or metal-coated materials can be considered.**

While Deinzer discloses a cartridge and fuel cell, Deinzer does not disclose the same structure as that claimed by Applicant. That is, applicant discloses and claims that the "housing containing and in direct contact with a liquid source of an oxidizable fuel." No such structural arrangement is disclosed by Deinzer.

Accordingly, contrary to the "**Examiner's note: The inner sleeve "312" is construed as being part of the wall of the housing." The limitation "sinking heat generated from external components to enhance a delivery rate of methanol in a vapor phase to the egress port of the container is construed as intended use.** " the latter limitation is not a statement of mere intended use, but along with the feature of "the housing containing and in direct contact with a liquid source of an oxidizable fuel" provides structural differences over Deinzer since the inner sleeve 312 prohibits this arrangement. Therefore, all of the features of claim 11 are entitled to patentable weight. In particular, the functional arrangement of the portion of the housing sinking heat is entitled to patentable weight since this recitation is more that a mere intended use of the claimed invention but rather is a claimed structural difference

between the claimed invention and the prior art that patentably distinguishes the claimed invention from the prior art. The examiner has not shown that "the prior art structure is capable of performing the intended use," and therefore the examiner has not met his burden to show that "it meets the claim."

Accordingly, the feature of "... with the at least a portion of a wall of the housing sinking heat generated from external components to enhance a delivery rate of the liquid source of oxidizable fuel in a vapor phase to the egress port of the container.", is entitled to patentable weight and therefore claim 11 is neither anticipated nor obvious over Deinzer

35 U.S.C. § 103

The examiner rejected Claims 1-10 and 16-22 under 35 U.S.C. 103(a) as being unpatentable over Lawrence et al (US 2002/0197522) in view of Hirsch et al (US 2004/0209133). The examiner stated:

> **The Lawrence reference discloses a fuel cartridge "39a" that supplies methanol to a direct methanol fuel cell comprising: a canister "92a" formed of anodized aluminum which is a thermally conductive material; a fuel bladder "86a" that is made of a plastic material which is thermally insulating; an exit port "88a", wherein at least a portion of the canister is disposed adjacent to the exit port (See paragraphs [0060],[0093],[0094]). It also discloses disposing a fuel cartridge "39" into a compartment of a portable electronic device "32" (See paragraph [0060]). It also discloses portable electronic devices such as computer laptops or notebooks (See paragraph [0064]).**
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> **Examiner's note: The housing of the fuel cartridge is construed as a two layer structure with one layer that is thermally conducting and the other layer that is thermally insulating. It is inherent that a portable electronic device such as a computer laptop comprises heat generating components. Therefore, since the fuel cartridge is in direct contact with the computer laptop, it would also be in thermal communication with a heat generating component of the portable electronic device because of the close proximity of the components. In addition, it is also inherent that a computer laptop comprises heat dissipating elements such as the CPU. Therefore, the fuel cartridge is disposed adjacent a heat dissipating element of the portable electronic device.**
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> **However, Lawrence et al does not expressly teach a surface area enhanced planar vaporization membrane residing in the fuel cartridge. The Hirsch reference discloses a removable fuel cartridge that includes a methanol delivery film that is a pervaporation membrane made of polyurethane that causes liquid methanol in the fuel cartridge to undergo a phase change to a vaporous fuel before it is delivered to the anode of the MEA (See paragraphs [0012],[0050],[0070]).**
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> **Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Lawrence fuel cartridge to include a surface area enhanced planar vaporization membrane residing in the fuel cartridge in order to allow for the use of a high concentration fuel while using passive water management capabilities (See paragraph [0012]).**

Examiner's note: The Lawrence fuel cartridge as modified by the Hirsch methanol delivery film would inherently permit heat that is generated by the component in the portable electronic device to increase a vapor pressure of the fuel in the housing to cause the fuel to egress from the cartridge as a vapor.

Claim 1 calls for a container that supplies a source of fuel to a direct methanol fuel cell. Claim 1 includes the features of a housing ... having at least a portion of a wall of the housing being comprised of a thermally conductive material, a fuel egress port supported by the housing; and a surface area enhanced planar vaporization membrane residing in the container.

Neither Lawrence nor Hirsh whether taken separately or in combination describe or suggest claim 1. The examiner principally relies on Lawrence to teach the feature of the container. Specifically, Lawrence teaches:

Removable fuel cartridge 39 generally includes an expandable fuel bladder 86, an expandable pressure member 87, and a sealable exit port 88, as shown schematically in FIG. 7. Removable fuel cartridge 39 includes a rigid canister 92 enclosing expandable fuel bladder 86 and the expandable pressure member. The fuel cartridge is dimensioned and configured such that the fuel bladder is capable of holding at least approximately 5 cubic centimeters of methanol, preferably at least approximately 7 cubic centimeters of methanol, and most preferably at least approximately 10 cubic centimeters. In the illustrated embodiment, a pair of spring clips 93 is provided to engage canister 92 with enclosure 66 and hold the canister in place until a user removes canister 92 from the enclosure to refuel fuel cell assembly 31.

However, Lawrence teaches that 88a, the exit port, is supported on the expandable fuel bladder 86,[1] not the housing, as called for in claim 1. As for item 88 in Figure 3, it does not appear that Lawrence provides a description of the configuration of that feature. Accordingly only 88a is available to the examiner to teach what is actually disclosed by Lawrence with respect to the exit port.

The examiner is indeed correct that Lawrence does not disclose "a surface area enhanced planar vaporization membrane residing in the container." The examiner uses Hirsh to teach this feature.

According to the examiner, "**The Hirsch reference discloses a removable fuel cartridge that includes a methanol delivery film that is a pervaporation membrane made of polyurethane that causes liquid methanol in the fuel**

[1] See Lawrence Figure 10

cartridge to undergo a phase change to a vaporous fuel before it is delivered to the anode of the MEA (See paragraphs [0012],[0050],[0070]).

Applicant notes however that claim 1 includes "a fuel egress port supported by the housing; and a surface area enhanced planar vaporization membrane." Hirsh by contrast envisions a shutter mechanism for a cartridge that is may include the methanol delivery film, MDF.[2] However, nothing in Hirsh suggests that MDF is a surface enhanced planar vaporization membrane.

Therefore, any combination of Hirsh with Lawrence neither describes nor suggests all of the features of claim 1.

The examiner rejected Claims 23 and 25 under 35 U S.C. 103(a) as being unpatentable over Deinzer et al (WO 03/043112) using (US 2006/0172171) as an equivalent English translation as applied to claim 11 above, and further in view of Lawrence et al (US 2002/0197522).

The examiner stated:

> **However, Deinzer et al does not expressly teach a fuel cartridge that is configured for a specific electronic device wherein the portion of the wall of the housing of the container is configured to be disposed adjacent a heating dissipating element of the electronic device. The Lawrence reference discloses a fuel cartridge "39" that is configured for a portable electronic device "32" such that the housing of the fuel cartridge is disposed adjacent a heating dissipating element of the electronic device (See paragraph [0060] and Figures 1 and 2). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Deinzer fuel cartridge for use in a portable electronic device such that the portion of the wall of the housing of the fuel cartridge is disposed adjacent a heating dissipating element of the electronic device in order to more efficiently utilize the fuel cartridge as a heat sink for a portable electronic device.**

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[2] [0050] The fuel delivery regulation assembly of the present invention is shown schematically in the figures now to be described in several alternative locations relative to the other components of the fuel cell system. It should be understood that those fuel cell system components may be fabricated and assembled in a variety of different configurations. For example, the liquid fuel may be contained in a removable, replaceable and/or refillable cartridge. Such a removable cartridge may also include the methanol delivery film, MDF. Alternatively, the fuel delivery regulation assembly itself might be contained within a removable cartridge or a detachable fuel container, or may be separately detachable, as is desired based on a particular system architecture. Or, one component of the fuel delivery regulation assembly of the present invention might be contained within the cartridge, and the corresponding component may be contained within the fuel cell, or in another portion of the fuel cell system that is not in the cartridge. In other applications, the entire fuel cell system, including the components just described, may be fully contained within a singular unit or housing. A fuel cell system in any of these configurations, or combinations thereof, or other configurations are contemplated as being within the scope of the present invention.

Claims 23 and 25 distinguish over Deinzer for the reasons discussed above. The examiner acknowledges that Deinzer does not suggest that the fuel cartridge of claim 11 is configured for a specific electronic device, and wherein the portion of the wall of the housing of the cartridge is configured to be disposed adjacent a heating dissipating element of the electronic device, and relies on Lawrence [0060] for this teaching. While Lawrence [0060][3] mentions a fuel cell assembly and a cellular telephone, these teachings do not however suggest "... **a fuel cartridge "39" that is configured for a portable electronic device "32" such that the housing of the fuel cartridge is disposed adjacent a heating dissipating element of the electronic device (See paragraph [0060] and Figures 1 and 2).**", as argued by the examiner. Therefore claim 23 and by analogy claim 25 are allowable over the combination of references.

The examiner rejected Claim 26 under 35 U.S.C. 103(a) as being unpatentable over Deinzer et al (WO 03/043112) using (US 2006/0172171) as an equivalent English translation as applied to claim 11 above, and further in view of Hirsch et al (US 2004/0209133).

The examiner stated:

> **However, Deinzer et al does not expressly teach a surface area enhanced planar vaporization membrane residing in the container. The Hirsch reference discloses a removable fuel cartridge that includes a methanol delivery film that is a pervaporation membrane made of polyurethane that causes liquid methanol in the fuel cartridge to undergo a phase change to a vaporous fuel before it is delivered to the anode of the MEA (See paragraphs [0012], [0050], [0070]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Deinzer fuel cartridge to include a surface area enhanced planar vaporization membrane residing in the fuel cartridge in order to allow for the use of a high concentration fuel while using passive water management capabilities (See paragraph [0012]).**

Claim 26 further limits claim 11 requiring a surface area enhanced planar vaporization membrane residing in the cartridge. As discussed above, Hirsh does not suggest a surface area enhanced planar vaporization membrane. No teaching of Hirsh suggests that the MDF is surface area enhanced.

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[3] [0060] A fuel cell assembly 31 for a portable electronic device 32 in accordance with the present invention is shown in FIG. 1. In the illustrated embodiment, the fuel cell assembly is a direct methanol fuel cell assembly and the portable electronic device is a mobile telephone. Methanol is a convenient liquid source of fuel which is easy to handle and is readily contained in a simple plastic enclosure. Methanol is also relatively inexpensive and is presently widely available. One should appreciate that other types of fuel can be used.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

In view of the foregoing remarks, applicant respectfully submits that the application is in condition for allowance and such action is respectfully requested at the examiner's earliest convenience.

All of the dependent claims are patentable for at least the reasons for which the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

No fee is due. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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